



Antiepileptic Medications

9/14/2012

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Overview

- Definitions and Treatment Rationale
 - What is a seizure? What is epilepsy?
 - Types of seizures
 - When to treat?
 - Treatment strategies
- Medications
 - Old and new
 - Certain meds for certain seizures
 - Specific medications and side effects
 - General principles and metabolism

Part 1: Definitions and Treatment Rationale



Seizures

- Definition: sudden surge of electrical activity in the brain that affects how a person acts or feels (epilepsy.com)
- Many varieties
 - Focal v. Generalized
- Often brief and unpredictable
- A single seizure is not epilepsy

Epilepsy

- Definition: a neurologic condition in which a person has 2 or more unprovoked seizures
- Clinical diagnosis
- Many different causes:
 - Brain injury: stroke
 - Genetics
 - Most causes are unknown

When to treat?

- Generally do not treat the first seizure
 - 50% of people with a single unprovoked seizure will not have another seizure
 - If abnormal MRI or EEG the risk of another seizure increases
- Treat after the second seizure
- If a person has 2 seizures approximately 75% have further further seizures

Treatment Strategies 1.

- NO SEIZURES AND NO SIDE EFFECTS
- Determine what type of seizures a person has
 - History, MRI and EEG
- Choose medicine based on
 - Type of seizures
 - Side effect profile
 - Dosing frequency
 - Economic considerations

Treatment Strategies 2.

- Educated trial and error process
- For the most part the medications have equal efficacy and are not studied against one another
- Start at low dose and gradually increase
- Start single medication and push to maximum tolerated dose
- Every person is different and therefore doses will be different

Treatment Strategies 3.

- If one medicine fails attempt a second monotherapy trial
- If second monotherapy trial fails attempt combination therapy
- When switching between medications titrate new medicine to “therapeutic” dose before weaning other medication

Drug Levels

- “TREAT THE PATIENT, NOT THE LEVEL”
- Adjust dose based on seizures and side effects
- Some exceptions
 - Document a low level
 - Document a level when patient is seizure free
 - Prior to a planned pregnancy

Part 2: Generic and Brand Name Medications



Older Antiepileptics in the U.S.

- Phenobarbital 1912
- Phenytoin (Dilantin) 1938
- Primidone (Mysoline) 1954
- Carbamazepine (Tegretol, Carbatrol) 1974
- Ethosuximide (Zarontin) 1960
- Valproate (Depakote) 1978

Newer Antiepileptics in the U.S.

• Felbamate (Felbatol)	1993
• Gabapentin (Neurontin)	1994
• Lamotrigine (Lamictal)	1995
• Topiramate (Topamax)	1996
• Tiagabine (Gabatril)	1997
• Oxcarbazepine (Trileptal)	1999
• Levetiracetam (Keppra)	2000
• Zonisamide (Zonegran)	2000
• Pregabalin (Lyrica)	2005
• Lacosamide (Vimpat)	2008
• Rufinamide (Banzel)	2008
• Vigabatrin (Sabril)	2009

Which Medicine for Which Seizure

- Phenytoin
- Carbamazepine
- Oxcarbazepine
- Phenobarbital
- Gabapentin
- Tiagabine
- Pregabalin



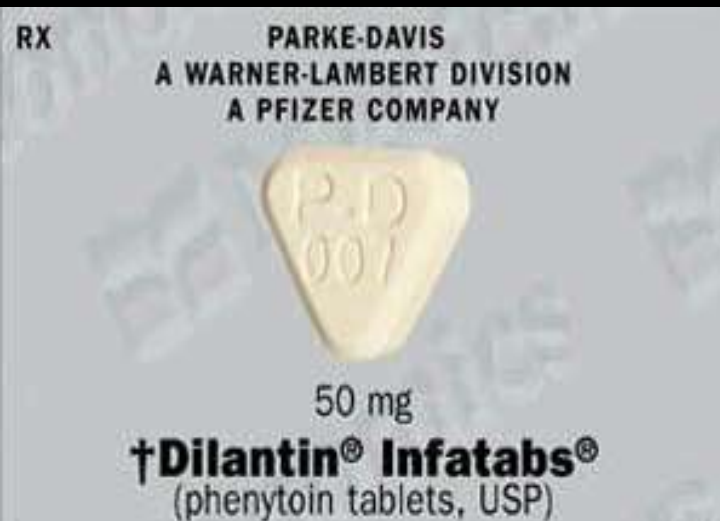
Focal Seizures

Phenobarbital



- All types of epilepsy
- Twice daily dosing
- Somnolence is most common side effect
- Long term use can cause osteopenia/osteoporosis
- Must be weaned very slowly

Phenytoin (Dilantin)



- All types of epilepsy
- Immediate release: three times daily
- Extended release: once daily
- Side effects: Dizziness, confusion, sedation, rash, N/V
- Long term side effects: osteoporosis, gingival hyperplasia, neuropathy, cerebellar degeneration

Carbamazepine (Tegretol)



- Focal seizures
- IR: 3-4 times daily
- ER: 2 times daily
- Side Effects: somnolence, dizziness, blurred vision
- Liver toxicity, osteoporosis
- Serious rash

Valproate (Depakote)



- Focal and generalized
- Depakote (DR): twice daily
- Depakote (ER): daily
- Side effects: somnolence, confusion, tremor, weight gain, hair loss
- Liver toxicity, pancreatitis, low platelets

Gabapentin (Neurontin)



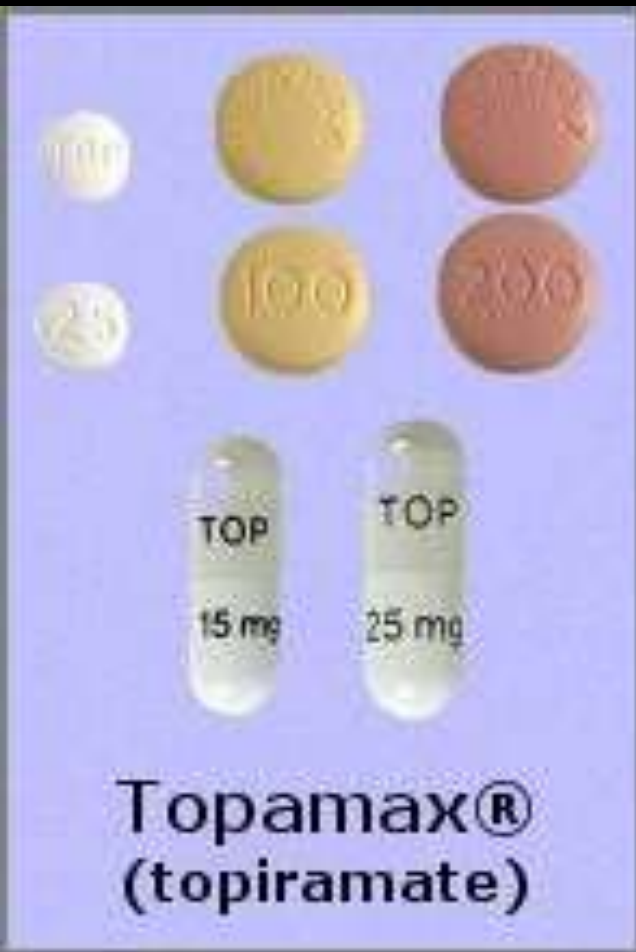
- Focal seizures
- Three times daily with wide dosage range
- Side Effects: dizziness, somnolence, peripheral edema

Lamotrigine (Lamictal)



- Focal and generalized
- Twice daily with wide dosage range
- Side effects: somnolence, dizziness, double vision, nausea/vomiting
- RASH-call doctor if experience a rash

Topiramate (Topamax)



- Focal and Generalized
- Twice daily
- Side Effects: somnolence, weight loss, memory impairment, word finding difficulty
- Kidney stones

Oxcarbazepine (Trileptal)



- Focal seizures
- Twice daily
- Side effects: somnolence, dizziness, double vision
- Low Sodium
- Serious rash

Levetiracetam (Keppra)



- Focal and generalized
- Twice daily
- Can be started relatively quickly
- Side effects: somnolence, dizziness
- Mood disturbances

Pregabalin (Lyrica)

- Focal seizures
- Twice or three times daily
- Side effects: dizziness, weight gain, somnolence



Lacosamide (Vimpat)



- Focal seizures
- Twice daily
- Side effects: N/V, gait instability, dizziness

Vigabatrin (Sabril)



- Focal seizures
- Twice daily

- Side Effects: weight gain, N/V, somnolence or insomnia, urinary tract infections
- Vision loss (tunnel vision). Tends to occur after a few weeks-months of treatment and tends to be asymptomatic.
- Treatment response is evident within weeks to months
- SHARE program

Metabolism and Excretion

- Almost all antiepileptics are metabolized by the liver and excreted by the kidneys
- Exceptions: gabapentin, lacosamide

General Principles

- Baseline labs and lab monitoring
- Antiepileptics have many different drug interactions
- Make sure your doctor knows all the other medications you are taking
- Do not stop an antiepileptic without talking with your doctor

Questions?